

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) A target detection apparatus comprising:
an optical irradiation unit which irradiates light,
an optical interference unit comprising helical organic molecules each having a target capturing body bonded thereto, said helical organic molecules being aligned to form a film-like material, wherein said optical interference unit is capable of: interacting~~which can interact~~ with a detection target, interfering~~interferes~~ with the light irradiated from the optical irradiation unit, ~~and radiates~~ radiating said light~~it~~ as interference light, and varying~~is able to vary~~ the wavelength of the interference light after interaction with the detection target, and
a wavelength change detecting unit placed in the path of the interference light which detects the wavelength variation of the interference light radiated by the optical interference unit.

2. (Currently amended) The~~A~~ target detection apparatus according to Claim 1, wherein the wavelength change detecting unit transmits light of a specific wavelength, and can detect that light of the specific wavelength has been passed through.

3. (Currently amended) TheA target detection apparatus according to Claim 2, wherein the wavelength change detecting unit comprises an interference filter, and an optical detection sensor which can detect light which has passed through the interference filter.

4. (Currently amended) TheA target detection apparatus according to Claim 1, wherein the wavelength change detecting unit measures a spectrum before wavelength change of the interference light and a spectrum after wavelength change of the interference light, and can measure their differential spectrum.

5. (Currently amended) TheA target detection apparatus according to Claim 4, wherein the wavelength change detecting unit transforms the differential spectrum into a spectral intensity, and can amplify the spectral intensity.

6. (Currently amended) TheA target detection apparatus according to Claim 4, wherein the wavelength change detecting unit is a spectrophotometer.

7. (Currently amended) TheA target detection apparatus according to Claim 1, wherein the optical interference unit radiates interference light as at least one selected from a reflected light and a transmitted light.

8. (Canceled)

9. (Currently amended) TheA target detection apparatus according to Claim 18, wherein the optical interference unit further comprises a substrate, and the film-like material is provided on the substrate.

10. (Currently amended) TheA target detection apparatus according to Claim 18, wherein each of the helical organic molecules is~~film-like material comprises a rod-shaped material.~~

11. (Currently amended) TheA target detection apparatus according to Claim 10, wherein the film-like material is formed by a coating method.

12. (Currently amended) TheA target detection apparatus according to Claim 9, wherein the substrate is formed from at least one of semiconductor, ceramics, metal, glass, and plastics.

13. (Currently amended) TheA target detection apparatus according to Claim 9, wherein the substrate comprises on a surface thereof an identical refractive index film having substantially the same refractive index ~~as to~~ a refractive index of the film-like material.

14. (Currently amended) TheA target detection apparatus according to Claim 9, wherein the substrate comprises on a surface thereof a different refractive index film having a different refractive index from the refractive index of the film-like material.

15. (Currently amended) TheA target detection apparatus according to Claim 14, wherein the refractive index of the different refractive index film is different from a refractive index of the substrate.

16. (Currently amended) TheA target detection apparatus according to Claim 14, comprising a plurality of different refractive index films, refractive indices of the plurality of different refractive index films being mutually different.

17. (Currently amended) TheA target detection apparatus according to Claim 14, wherein the different refractive index film is a dielectric film.

18. (Currently amended) TheA target detection apparatus according to Claim 9, wherein the substrate is an interference filter.

19. (Currently amended) TheA target detection apparatus according to Claim 18, wherein at least a second ~~one~~ film is ~~further~~ formed on the surface of said ~~the~~ film-like material.

20. (Currently amended) TheA target detection apparatus according to Claim 19, wherein said second~~the~~ film has a refractive index substantially the same as~~to~~ the refractive index of the substrate surface in contact with the film-like material.

21. (Currently amended) TheA target detection apparatus according to Claim 18, wherein the thickness of the film-like material is from 50nm to 1 μ m.

22. (Currently amended) TheA target detection apparatus according to Claim 18, wherein the film-like material is one of a monomolecular layer and~~of a rod-shaped material and~~ a laminated film of the monomolecular layer~~layers~~.

23. (Canceled)

24. (Canceled)

25. (Currently amended) TheA target detection apparatus according to Claim 124, wherein the helical organic molecules are~~molecule is an~~ α -helix polypeptides~~polypeptide~~.

26. (Canceled)

27. (Currently amended) TheA target detection apparatus according to Claim 126, wherein the target ~~capturing body~~~~detection part~~ is capable of interacting~~can interact~~ with the detection target by at least one selected from physical adsorption and chemical adsorption.

28. (Canceled)

29. (Currently amended) TheA target detection apparatus according to Claim 128, wherein the target capturing body is at least one selected from enzyme, coenzyme, enzyme substrate, enzyme inhibitor, a clathrate compound, metal, antibody, antigen, protein, microorganism, virus, cell debris, metabolic product, nucleic acid, hormone, hormone receptor, lectin, sugar, physiologically active substance and physiologically active substance-receptor.

30. (Currently amended) TheA target detection apparatus according to Claim 29, wherein:

the clathrate compound is further selected from a monomolecular host compound, a polymolecular host compound, a polymer host compound, and an inorganic host compound;

the monomolecular host compound is further selected from cyclodextrin, a crown compound, cyclophane, azacyclophane, calixarene, cyclotrimeratrylene, spherand, cavitand and, cyclic oligopeptide;

the polymolecular host compound is further selected from urea, thiourea, deoxycholic acid, perhydrotriphenylene, and tri-o-thymotide;

the polymer host compound is further selected from cellulose, starch, chitin, chitosan, and polyvinyl alcohol; and

the inorganic host compound is further selected from an interlayer compound, zeolite, and a Hofmann complex.

31. (Currently amended) TheA target detection apparatus according to Claim 28, wherein the detection target is avidin, and the target capturing body is biotin.

32. (Currently amended) TheA target detection apparatus according to Claim 1, wherein the optical irradiation unit can irradiate a pencil light beam.

33. (Currently amended) TheA target detection apparatus according to Claim 1, wherein the optical irradiation unit is a laser irradiation device.

34. (Currently amended) A target detection substrate comprising:
an optical interference unit comprising helical organic molecules each having a target capturing body bonded thereto, said helical organic molecules being aligned to form a film-like material; and

a substrate,

wherein the film-like material is provided on the substrate, and the target detection substrate is capable of interacting~~can interact~~ with a detection target, interfering~~interfere~~ with

irradiated light and ~~radiating the light~~ radiate it as interference light, and ~~changing~~ change the wavelength of the interference light after interacting with the detection target.

35. (Currently amended) TheA target detection substrate according to Claim 34, wherein the interaction is at least one selected from physical adsorption and chemical adsorption.

36. (Currently amended) TheA target detection substrate according to Claim 34, wherein the interference light is radiated as at least one of reflected light and transmitted light.

37. (Currently amended) TheA target detection substrate according to Claim 34, wherein ~~each of the helical organic molecules is film-like material is formed of a rod-shaped material.~~

38. (Currently amended) TheA target detection substrate according to Claim 34, wherein the substrate is formed from at least one of semiconductor, ceramics, metal, glass, and plastics.

39. (Currently amended) TheA target detection substrate according to Claim 34, wherein the substrate comprises on a surface thereof an identical refractive index film having substantially the same refractive index ~~as to~~ a refractive index of the film-like material.

40. (Currently amended) TheA target detection substrate according to Claim 34, wherein the substrate comprises on a surface thereof a different refractive index film having a different refractive index from the refractive index of the film-like material.

41. (Currently amended) TheA target detection substrate according to Claim 40, wherein the refractive index of the different refractive index film is different from a refractive index of the substrate.

42. (Currently amended) TheA target detection substrate according to Claim 40, comprising a plurality of different refractive index films, refractive indices of the plurality of different refractive index films being mutually different.

43. (Currently amended) TheA target detection substrate according to Claim 40, wherein the different refractive index film is a dielectric film.

44. (Currently amended) TheA target detection substrate according to Claim 34, wherein the substrate is an interference filter.

45. (Currently amended) TheA target detection substrate according to Claim 34, wherein at least one dielectric film is further formed on the surface of the film-like material.

46. (Currently amended) TheA target detection substrate according to Claim 34, wherein the thickness of the film-like material is from 50nm to 1μm.

47. (Currently amended) TheA target detection substrate according to Claim 34, wherein the film-like material is one of a monomolecular layer ~~of a rod-shaped material~~ and a laminated film of the monomolecular layer~~layers~~.

48.-49. (Canceled)

50. (Currently amended) TheA target detection substrate according to Claim ~~34~~49, wherein the helical organic molecules are~~molecule is an~~ α-helix polypeptides~~polypeptide~~.

51. (Currently amended) A target detection method comprising the steps of:
irradiating light to an optical interference unit ~~that~~which is capable of interacting~~ean~~
~~interact~~ with a detection target, and radiating~~radiate~~ the light as interference light; said optical
interference unit comprising helical organic molecules each having a target capturing body
bonded thereto, and said helical organic molecules being aligned to form a film-like material,
and

detecting a wavelength change of the interference light upon capture of said detection
target by said optical interference unit.

52. (Currently amended) TheA target detection method according to Claim 51, wherein the optical interference unit can change the wavelength of the interference light after interaction with the detection target.

53. (Currently amended) TheA target detection method according to Claim 51, wherein the optical interference unit is a target detection substrate formed from a film-like material on a substrate, wherein said optical interference unit is capable of: interacting~~can interact~~ with a detection target, interfering~~interferes~~ with irradiated light and radiating the light~~radiates it~~ as interference light, and changing~~can change~~ the wavelength of the interference light after interaction with the detection target.